



2016 Astrophysics Medium Explorer (MIDEX), Mission of Opportunity (MO) & USPI Preproposal Conference

Conference Goals

Wilton Sanders
Astrophysics Explorers Program Scientist
NASA Headquarters
October 6, 2016



Conference Goals

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The Astrophysics Explorers Program has released three solicitations for new science investigations:

- **2016 Medium Explorer (MIDEX) Announcement of Opportunity** (2016 MIDEX AO) – NNH16ZDA0100
- **2016 Mission of Opportunity** Program Element Appendix for the Second Stand Alone Missions of Opportunity Notice (2016 MO SALMON-2 PEA R) – NNH12ZDA006O-APEXMO3.
- **2016 Astrophysics Explorer U.S. Participating Investigators** Program Element for the Research Opportunities in Space and Earth Sciences 2016 NRA (2016 APEX USPI) - NNH16ZDA001N-APEXUSPI



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Goals today are to:

- Provide an overview of the
 - 2016 MIDE X AO
 - 2016 MO SALMON-2 PEA R
 - 2016 APEX USPI ROSES-2016 program element
- Provide an overview of the evaluation, categorization, and selection process for the MIDE X and MO
- Address questions



Conference Goals Agenda

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10:00	Welcome	Paul Hertz, NASA HQ
10:05	Conference Goals and Overview of the Solicitations	Wilt Sanders, NASA HQ
10:35	ROSES-2016 USPI Presentation	Wilt Sanders, NASA HQ
10:50	Overview of the Evaluation, Categorization, & Selection Process	Wilt Sanders, NASA HQ
11:10	Science Evaluation	Wilt Sanders, NASA HQ
11:25	Technical, Management, and Cost Evaluation	Odilyn Luck, NASA LaRC
10:55	Break	
12:55	Explorers Program Overview	Christine Hinkle, NASA GSFC
1:10	Launch Services	Chuong Nguyen, NASA KSC
1:50	Mission Operations and Communications Services	Gary Morse, NASA HQ
2:10	International Participation	Jessica Glover, NASA HQ
2:25	Break	
2:40	Export Control	John Hall, NASA HQ
3:00	ISS Research Resource Accommodation and Technical Interface Requirements Overview	Kenol Jules, NASA JSC
3:20	Balloon Investigations	Debora Fairbrother, NASA Wallops
3:40	CubeSats, sRLVs & Secondary Payloads	David Pierce, NASA HQ
4:00	Questions & Answers	All



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Questions

- Answers to questions received prior to the Workshop are included in presentations and/or being addressed on the Q&A web site.
- Questions submitted today will be addressed as time permits and as appropriate answers can be generated.
- Please submit your questions in writing so that we may best understand your intent.
- WebEx users, please submit questions via the WebEx chat lines.
- Questions may also be sent to Wilton Sanders at:
wilton.t.sanders@nasa.gov
- Questions may be submitted until 14 days before the proposal due date. Questions and answers will be posted at the Astrophysics Explorers Acquisition site:

<http://explorers.larc.nasa.gov/APMIDEX2016/>



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Overview of the Solicitations

Wilton Sanders
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Solicitations Overview

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Outline

- Overview of the three solicitations
 - 2016 MIDEX AO
 - 2016 MO SALMON-2 PEAR
 - 2016 ROSES-2016 APEX USPI

Important Note: These solicitations incorporate a large number of changes relative to the drafts and previous Explorer solicitations, including both policy changes and changes to proposal submission requirements. All proposers must read the solicitations carefully, and all proposals must comply with the requirements, constraints, and guidelines contained within.



Solicitations Overview

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The Astrophysics Explorers Program has released 3 solicitations:

2016 Medium Explorer Announcement of Opportunity (2016 MIDEX AO) – NNH16ZDA0100

Issued for the purpose of soliciting proposals for investigations to be implemented through the Explorer Program. All investigations proposed in response to this solicitation must support the goals and objectives of the Explorer Program, must be implemented by Principal Investigator (PI) led investigation teams, and must be implemented through the provision of **complete spaceflight missions.**



Solicitations Overview

2016 Astrophysics
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The Astrophysics Explorers Program has released 3 solicitations:

2016 Mission of Opportunity Program Element Appendix for NASA's Second Stand Alone Missions of Opportunity Notice (2016 MO SALMON-2 PEA R) – NNH12ZDA006-APEXMO3

Issued for the purpose of soliciting proposals for **Mission of Opportunity (MO) science investigations**. All investigations proposed in response to this solicitation must support the goals and objectives of the Explorer Program, must be implemented by Principal Investigator (PI) led investigation teams, and must be implemented through the provision of space investigations



Solicitations Overview

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The Astrophysics Explorers Program has released 3 solicitations:

2016 Astrophysics Explorers U.S. Participating Investigators Program
Element for the Research Opportunities in Space and Earth Sciences 2016
NRA (2016 APEX USPI) - NNH16ZDA001N-APEXUSPI

Issued for the purpose of soliciting potential Explorer Program Mission of Opportunity (MO) investigations in which **investigators participate as a Co-I for an instrument, experiment, or technology demonstration** that is being built and flown by a sponsor agency other than NASA. The provision of flight hardware is not solicited through this USPI solicitation.



Solicitations Overview

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Proposal Opportunity Period and Schedule

Notice of Intent to Propose	October 13, 2016
Proposal Submission Deadline 11:59 pm EST	December 15, 2016
Letters of Commitment due (w/ proposal)	December 15, 2016
Deadline for Receipt of Proposal on CD-ROM at 5:00 p.m. EST	December 20, 2016
Step 1 Selections announced (target)	Summer 2017
Initiate Phase A Concept Studies (target)	Summer 2017
Phase A Concept Study Reports due (target)	Spring 2018
Down-selection of Investigation(s) for flight (target)	Early 2019
Launch Readiness Date for proposed mission	NLT December 31, 2023
Commitment Need Date for a Partner MO	NLT December 31, 2021
Launch Readiness Date for Small Complete Missions	NLT December 31, 2022



MIDEX AO Highlights

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2016 MIDEX AO is based on the SMD Standard AO template.

- **Requirements** are identified, numbered, and specific.
 - There are 87 requirements in the 2016 MIDEX AO main body
 - When Sections do not levy requirements they do not have numbered requirements.
- **Evaluation Factors** are identified, numbered, and specific.
 - 4 for Science Merit
 - 6 for Scientific Implementation Merit and Feasibility
 - 5 for Technical, Management, and Cost (TMC) Feasibility
- Appendix B has numbered **requirements on Proposal Preparation**
 - There are 67 specific requirements for the format and content of Step 1 proposals [more altogether as some Appendix B requirements have more than one part]



MIDEX AO Highlights

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- The PI-Managed Mission Cost cap for a Medium Explorer (MIDEX) mission is \$250M in Fiscal Year (FY) 2017 dollars, not including the cost of Expendable Launch Vehicle (ELV) or any contributions.
- The sum of contributions of any kind to the entirety of the investigation is not to exceed one-third (1/3) of the proposed PI-Managed Mission Cost.
- Standard launch services on an ELV will be provided for MIDEX missions at no charge against the PI-Managed Mission Cost. Any launch services beyond the standard launch services offered must be funded out of the PI-Managed Mission Cost.
- Launch services may not be arranged by the proposer.



MIDEX AO Highlights

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- Any selected mission is intended to launch no later than the end of calendar year 2023.
 - Proposers selected through this AO will be awarded a contract to conduct a Phase A concept study with a duration of ~ 9 months. The cost of the Phase A concept study is capped at \$2M FY2017 dollars.



MIDEX AO Highlights

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Requirement 1: Proposals submitted in response to this solicitation shall be submitted electronically no later than the Electronic Proposal Submittal Deadline.

Requirement 2: In addition to electronic submission, two CD-ROMs containing the proposal and relevant files described in Section 6.2.3 must be submitted. Proposals on CD-ROMs submitted in response to this solicitation shall be delivered no later than the Deadline for Receipt of Proposal on CD-ROMs and shall be delivered to the address for submittal of proposals given in Section 6.2.3.



MIDEX AO Highlights

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The address for delivery of CD-ROMs (Requirement 86):

NASA Research and Education Support Services (NRESS)
Suite 500
2345 Crystal Drive
Arlington, VA 22202

Telephone for commercial delivery: 202-479-9030

NASA will notify proposers that their proposals have been received.

Requirement 4: Proposals shall describe a science investigation with goals and objectives that address the program science objectives described in Section 2.



MO SALMON-2 PEA-R Highlights

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- *SALMON-2* is a five-year omnibus AO that incorporates PEAs for general MO proposal opportunities, as well as focused proposal opportunities for specific flight opportunities. The AO allows U.S. and non-U.S.-led mission opportunities.
- Each PEA is a separate and independent solicitation, has its own solicitation number in NSPIRES, its own proposal due date, and its own funding available for selected investigations.
- NNH12ZDA006O Program Element Appendix R is the 2016 APEXMO3 SALMON-2 PEA. Investigations are funded from the Astrophysics Explorers Future Missions budget line.



Three Mission of Opportunity types may be proposed
in response to this 2016 APEXMO3 SALMON-2 PEA

- **Partner Missions of Opportunity (PMOs)**
- **New Missions using Existing Spacecraft (NMESs)**
- **Small Complete Missions (SCM) including:**
 - Investigations on the International Space Station
 - Suborbital-class missions (investigations requiring flight on high altitude scientific balloon platforms, on suborbital Reusable Launch Vehicles [sRLVs], or using CubeSats)
 - Investigations launched as secondary payloads or launched as hosted payloads



Cost and Schedule Constraints

- \$70M cap in Fiscal Year 2017 dollars
- \$35M cap in Fiscal Year 2017 dollars for suborbital-class missions
- Access to space provided by NASA for ISS investigations and suborbital-class SCM.
- Phase A Studies, ~ 9 month duration, capped at \$500K FY17
- For PMOs, PI must provide evidence of sponsoring organization funding primary host mission, although the particular mission selection may not yet have been made. For example, if a non-US space agency has announced that they will select in the near future a (currently not identified) mission, a MO proposal for one of those missions may be compliant if it meets other constraints. Need date for NASA commitment is before December 31, 2021. The launch date itself for a PMO is not constrained.
- For SCM, launch date is NLT December 31, 2022.



MO SALMON-2 PEA-R Highlights

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- PMOs may be proposed for participation in nonstrategic NASA missions, other than Explorer.
- Such a PMO proposal must satisfy the following requirements: (i) The PI of the host mission provides a Letter of Commitment endorsing the partnership and (ii) the feasibility assessment of the host mission, i.e., the TMC evaluation in Step 1 and Step 2, includes the accommodations for the PMO instrument .



MO SALMON-2 PEA-R Highlights

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In addition to the requirements given in the SALMON-2 AO, all proposed PMO investigations must also demonstrate:

- 1) their formal relationship with the sponsoring agency's host mission (e.g., already selected contribution, invited contribution, or proposed contribution); and
- 2) the status of the host mission within the sponsoring agency (i.e., Pre-Phase A, Phase A, or Phase B), including the level of commitment that the sponsoring agency has made to complete the mission.



MO SALMON-2 PEA-R Highlights

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In addition to requirements given in SALMON-2, all PMO requiring flight on the ISS must also provide a Letter of ISS Technical Interface and Resource Accommodation Feasibility Assessment from the NASA Space Station Research Integration Office. This letter must contain:

- 1) a description of the formal relationship with the sponsoring agency's host mission for access and accommodation at the space station,
 - 2) identification of known challenges and/or conditional provisions for access or accommodation of the host mission, and
 - 3) a description of the level of technical interchange and negotiation required to mature the host mission's provisions for access and accommodation.
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MO SALMON-2 PEA-R Highlights

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In addition to requirements given in SALMON-2, all proposed SCM, with the exception of investigations requiring flight on the ISS, suborbital-class missions, or NASA-provided launch vehicles must also provide a Letter of Commitment from the program or agency providing access to space containing:

- 1) a detailed description of the proposed provisions for access to space, and
- 2) the status of those proposed flight provisions within the sponsoring program or agency (i.e., conditional, confirmed, conceptual, etc.) including the level of commitment that the sponsoring program/agency has made to support that flight opportunity.



MO SALMON-2 PEA-R Highlights

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In addition to requirements given in SALMON-2, all SCM investigations requiring flight on the ISS must also provide a Letter of ISS Technical Interface and Resource Accommodation Feasibility Assessment from the NASA Space Station Research Integration Office containing:

- 1) a preliminary assessment of the feasibility of proposed provisions for access to and accommodation on the ISS,
 - 2) identification of known technical interface challenges and/or conditional provisions for access or accommodation, and
 - 3) a description of the level of technical interchange and negotiation required to mature the proposed provisions for access and accommodation.
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MO SALMON-2 PEA-R Highlights

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- The SALMON-2 AO provides that a proposal may be selected for development without first completing a Phase A concept study. The proposal must make the case that it is not only necessary, but that it is also technically feasible.
- The proposer must recognize that NASA would only make such a decision if the proposal was especially compelling.
- Recall, for this AO, KDP-A is the selection of a Step-1 proposal for a Phase A concept study, KDP-B is the downselection of a mission to enter Phase B following evaluation of Concept Study Reports.



Additional Elements for 2016 MIDEX AO and Salmon-2 PEA-R investigations

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Science Enhancement Options

- Activities such as guest investigator programs, general observer programs, participating scientist programs, interdisciplinary scientist programs, and/or archival data analysis programs, where appropriate, have the potential to broaden the scientific impact of investigations. Such optional activities may be proposed as Science Enhancement Options (SEOs).
- Costs for proposed SEO activities must be defined, but will not count against the PI-Managed Mission Cost cap. Funding for SEO activities prior to Phase E should be minimized.
- As these proposed activities are optional and are not included within the cost capped baseline investigation, the science enabled by SEO activities is not considered as part of the scientific merit of the proposed investigation.
- See SALMON-2 section 5.2.5, Requirements 19-21.



Additional Elements for 2016 MIDEX AO and Salmon-2 PEA-R investigations

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Student Collaboration

- Proposals may define a Student Collaboration (SC) that is a separate part of the proposed investigation.
- The SC could be in the form of an instrument development, an investigation of scientific questions, analysis and display of data, development of supporting hardware or software, or other aspects of the investigation.
- Student Collaboration proposals, if any, will be evaluated only for the impact they have on science implementation feasibility to the extent that they are not separable; student collaboration proposals will not be penalized in Step 1 for any inherent higher cost, schedule, or technical risk, as long as the student collaboration is shown to be clearly separable from the implementation of the Baseline Science Mission.
- The intrinsic merit of student collaborations will not be evaluated at this time.
- See SALMON-2 section 5.7.2, Requirements 71-72



Additional Elements for 2016 MIDEX AO and Salmon-2 PEA-R investigations

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Education and Public Outreach

- This PEA does not require an Education and Public Outreach program; therefore Requirements 69 and 70 of the SALMON-2 AO do not apply to this PEA.
- However, NASA may impose E/PO requirements during, or subsequent to, the Phase A concept study phase.



Additional Elements for 2016 MIDEX AO and Salmon-2 PEA-R investigations

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- In addition to the mission selections, NASA has set aside funding sufficient to select up to two Category III proposals for technology development.

Category III. Scientifically or technically sound investigations which require further development. Category III investigations may be funded for development and may be reconsidered at a later time for the same or other opportunities